

IN THE CLAIMS:

The following is a complete listing of the claims, and replaces all earlier version and listings.

1. (currently amended) A color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than ~~said~~ the black ink, the apparatus completing a record image in a predetermined recording area including pixels on ~~said~~ the recording medium by causing ~~said~~ respective each of the black recording head and the respective color recording heads to perform a plurality of recording scans in the same pixel, ~~the~~ said apparatus comprising:

data generating means, which, for each of the plurality of recording heads, uses mask patterns to generate image data for each of ~~said~~ the recording scans corresponding to ~~said~~ the predetermined recording area, so that black image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans, and color image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans,

wherein each of the mask patterns for ~~said~~ the black image data and color image data used during the same recording scan has different allotment rates.

2. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein mask pattern having different allotment rates are used as the mask patterns for ~~said~~ the black image data and color image data.

3. (currently amended) A color ink-jet recording apparatus according to claim 1, further comprising black image data allotment rate setting means for setting, for each of ~~said~~ the recording scans, allotment rates for the mask patterns for ~~said~~ the black image data; and

color image data allotment rate setting means for setting, for each of ~~said~~ the recording scans, allotment rates for the mask patterns for ~~said~~ the color image data[[;]],

wherein both said image data allotment rate setting means set different allotment rates for the mask patterns for ~~said~~ the black image data and color image data used during the same recording scan.

4. (currently amended) A color ink-jet recording apparatus according to claim 3, wherein if said black image data allotment rate setting means sets an allotment rate higher than a predetermined reference allotment rate, the color image data allotment rate setting means sets an allotment rate lower than ~~said~~ the reference allotment rate, and if said black image data allotment rate setting means sets an allotment rate lower than ~~said~~ the reference allotment rate, the color image data allotment rate setting means sets an allotment rate higher than ~~said~~ the reference allotment rate.

5. (currently amended) A color ink-jet recording apparatus according to claim 4, wherein ~~said~~ the reference allotment rate is $100/N\%$ where N is the number of a plurality of recording scans performed in ~~said~~ the predetermined recording area.

6. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein when a black image is to be formed in said predetermined area, before or after the black ink is caused to impact the recording medium, at least one of ~~said~~ the plural types of color ink is caused to impact locations onto which the black ink is ejected.

7. (currently amended) A color ink-jet recording apparatus according to claim 1, further comprising a thinning means, which thins ~~said~~ the black image data at a predetermined thinning rate and causes the plural types of color ink to impact portions of the recording area in which ~~said~~ the black image data has been thinned.

8. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein at least one of ~~said~~ the plural types of color ink is reactive and tends to cause ~~said~~ the black ink to solidify or cohere when contacting with ~~said~~ the black ink.

9. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein said recording heads execute[[s]] recording only during

scans in one of the forward and backward scanning directions, and in the scanning direction in which the recording is carried out, said color recording heads are arranged in front of said black recording head.

10. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein if said recording heads carry out recording in both the forward and backward scanning directions, then during the first recording scan, ~~said~~ the color image data has a higher allotment rate than ~~said~~ the black image data.

11. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein ~~said~~ the plural color ink types include cyan, magenta, and yellow ink.

12. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein said recording heads ~~exert~~ apply thermal energy to generate bubbles in the ink so that energy generated by the bubbles causes the ink to be ejected.

13. (currently amended) A color ink-jet recording method using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than ~~said~~ the black ink, the method completing a record image in a predetermined recording area including pixels on ~~said~~ the recording medium by causing ~~said~~ respective each of the black recording head and

the respective color recording heads to perform a plurality of recording scans in the same pixel, the method comprising the steps of:

for each of the plurality of recording heads, generating image data for each of said the recording scans corresponding to said the predetermined recording area, by using mask patterns, so that black image data corresponding to said the predetermined recording area are allotted to each of said the recording scans, and color image data corresponding to said the predetermined recording area are allotted to each of said the recording scans; and

ejecting said the black ink and said the color ink from said the black recording head and said the color recording heads during each of said the recording scans on the basis of the data allotted to each of said the recording scans in said generating step;

wherein each of the mask patterns for said the black image data and color image data used during the same recording scan has different allotment rates.

14. (Cancelled)

15. (currently amended) A color ink-jet recording method according to claim 13, further comprising the black image data allotment rate setting step of setting, for each of said the recording scans, allotment rates for the mask patterns for said the black image data; and

the color image data allotment rate setting step of setting, for each of said the recording scans, allotment rates for the mask patterns for said the color image data[[:]],

wherein both said image data allotment rate setting steps set different allot rates for the division patterns for ~~said~~ the black image data and color image data used during the same recording scan.

16. (currently amended) A color ink-jet recording method according to claim 15, wherein if said black image data allotment rate setting step sets an allotment rate higher than a predetermined reference allotment rate, then the color image data allotment rate setting step sets an allotment rate lower than ~~said~~ the reference allotment rate, and if said black image data allotment rate setting step sets an allotment rate lower than ~~said~~ the reference allotment rate, the color image data allotment rate setting step sets an allotment rate higher than ~~said~~ the reference allotment rate.

17. (currently amended) A color ink-jet recording method according to claim 16, wherein ~~said~~ the reference allotment rate is $100/N\%$ where N is the number of a plurality of recording scans performed in ~~said~~ the predetermined recording area.

18. (currently amended) A color ink-jet recording method according to claim 13, wherein when a black image is to be formed in ~~said~~ the aid predetermined area, before or after the black ink is caused to impact the recording medium, at least one of ~~said~~ the plural types of color ink is caused to impact locations onto which the black ink is ejected.

19. (currently amended) A color ink-jet recording method according to claim 13, further comprising a thinning step, which thins ~~said~~ the black image data at a predetermined thinning rate and causes the plural types of color ink to impact portions of the recording area in which ~~said~~ the black image data has been thinned.

20. (currently amended) A color ink-jet recording method according to claim 13, wherein at least one of ~~said~~ the plural types of color ink is reactive and tends to cause ~~said~~ the black ink to solidify or cohere when contacting with ~~said~~ the black ink.

21. (Cancelled)

22. (currently amended) A color ink-jet recording method according to claim 13, wherein if ~~said~~ the recording heads carry out recording in both the forward and backward scanning directions, then during the first recording scan, ~~said~~ the color image data has a higher allotment rate than ~~said~~ the black image data.

23. and 24. (Cancelled)

25. (currently amended) A method of processing image data used in a color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed

than ~~said~~ the black ink, the apparatus completing a record image in a predetermined recording area including pixels on ~~said~~ the recording medium by causing ~~said~~ respective each of the black recording head and the respective color recording heads to perform a plurality of recording scans in the same pixel, the method comprising the step of:

for each of the plurality of recording heads, generating image data for each of ~~said~~ the recording scans corresponding to ~~said~~ the predetermined recording area, by using mask patterns, so that black image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans, and color image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans; and,

wherein each of the mask patterns for ~~said~~ the black image data and color image data used during the same recording scan has different allotment rates.

26. (currently amended) A program for executing image processing on image data used in a color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that ejects color ink on the basis of color image data, the color ink permeating through a recording medium at a higher speed than ~~said~~ the black ink, the apparatus completing a record image in a predetermined recording area including pixels on ~~said~~ the recording medium by causing ~~said~~ respective each of the black recording head and the respective color recording heads to perform a plurality of recording scans in the same pixel, the program comprising the step of:

for each of the plurality of recording heads, generating image data for each of ~~said~~ the recording scans corresponding to ~~said~~ the predetermined recording area, by using mask patterns, so that black image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans, and color image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans, ~~and,~~

wherein each of the mask patterns for ~~said~~ the black image data and color image data used during the same recording scan has different allotment rates.

27. (currently amended) A computer-readable storage medium storing the program set forth in claim 26.

28. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein the allotment rate of the mask pattern for ~~said~~ the black image data used in one recording scan of two recording scans among ~~said~~ the plurality of recording scans is different from the allotment rate of the mask pattern for ~~said~~ the black image data used in the other recording scan of ~~said~~ the two recording scans.

29. (currently amended) A color ink-jet recording apparatus according to claim 1, wherein the allotment rate of the mask pattern for ~~said~~ the color image data used in one recording scan of two recording scans among ~~said~~ the plurality of recording scans is different from the allotment rate of the mask pattern for ~~said~~ the color image data used in the other recording scan of ~~said~~ the two recording scans.

30. (currently amended) A color ink-jet recording apparatus using a black recording head that ejects black ink on the basis of black image data and color recording heads that eject color ink on the basis of color image data, the color ink permeating thorough a recording medium at a higher speed than ~~said~~ the black ink, the apparatus completing a record image in a predetermined recording area including pixels on ~~said~~ the recording medium by causing ~~said~~ respective each of the black recording head and the respective color recording heads to perform a plurality of recording scans in the same pixel, the apparatus comprising:

data generating means, which, for each of the plurality of recording heads, uses mask patterns to generate image data for each of ~~said~~ the recording scans corresponding to ~~said~~ the predetermined recording area, so that black image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans, the color image data corresponding to ~~said~~ the predetermined recording area are allotted to each of ~~said~~ the recording scans,

wherein the allotment rates of the respective mask patterns for ~~said~~ the black and color image data used in one recording scan of two recording scans among ~~said~~ the plurality of recording scans are different to each other, and the allotment rates of the respective mask patterns for ~~said~~ the black and color image data used in the other recording scan of ~~said~~ the two recording scans are different to each other.